

HITACHI

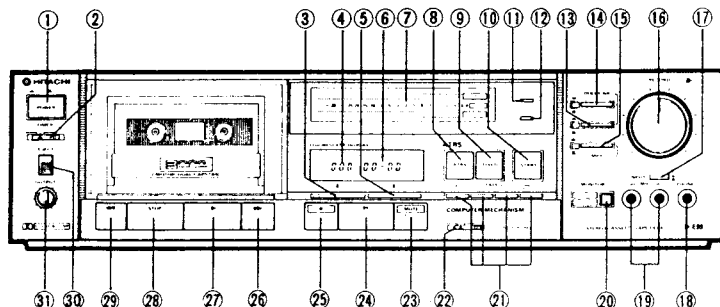
SERVICE MANUAL

TK

No. 1659E

D-E99

(U, C, FS, BS, AU, W)



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KEY TO ILLUSTRATIONS

- | | |
|-----------------------------------|------------------------------|
| ① POWER (MAINS) SWITCH | ①⑦ INPUT SELECT SWITCH |
| ② TIMER SWITCH | ①⑧ HEADPHONE SOCKET |
| ③ COUNTER RESET SWITCH | ①⑨ MICROPHONE SOCKETS |
| ④ TAPE COUNTER | ②① MONITOR SWITCH |
| ⑤ ELAPSED TIME RESET SWITCH | ②② TAPE SELECT SWITCHES |
| ⑥ ELAPSED TIMER | ②③ AUTO/MEMORY REWIND SWITCH |
| ⑦ DIGITAL PEAK METER | ②④ REC. MUTE BUTTON |
| ⑧ ATRS BUTTON | ②⑤ PAUSE BUTTON |
| ⑨ FIXED BUTTON | ②⑥ RECORD BUTTON |
| ⑩ ATRS START BUTTON | ②⑦ FAST FORWARD BUTTON |
| ⑪ BATTERY INDICATOR | ②⑧ PLAYBACK BUTTON |
| ⑫ TEST INDICATOR | ②⑨ STOP BUTTON |
| ⑬ DOLBY B/C NR CHANGE OVER SWITCH | ②⑩ REWIND BUTTON |
| ⑭ DOLBY NR SWITCH | ③① EJECT BUTTON |
| ⑮ MPX SWITCH | ③② OUTPUT LEVEL CONTROL |
| ⑯ RECORDING LEVEL CONTROLS | |

SAFETY PRECAUTION

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes.
Critical parts are marked with Δ in the schematic diagram and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

STEREO CASSETTE TAPE DECK

December 1981

TOKAI WORKS

SPECIFICATIONS

Semiconductors :		Dolby C NR ON :	75 dB (Weighted A, Reference 3% THD, Metal tape)
Modules :	5		75 dB*
ICs :	11	Wow and Flutter :	0.032% (WRMS)
Transistors :	58		0.10%*
FETs :	2	Input Sensitivity and Impedance :	
Diodes :	58	Microphone :	0.4mV, 300 ohms-5 kohms
LEDs :	14	Line in :	100mV, 50 kohms or more
Track System :	4 track 2 channel stereo	Output Level :	500mV
Tape :	Cassette tape (C-30, 60, 90)	Output Load Impedance :	
Tape Speed :	4.75cm/s	Line out :	50 kohms or more
Recording System and		Headphone :	8 ohms-2 kohms
Bias Frequency :	AC bias, 105 kHz	Distortion :	0.8% (1 kHz, 160 nwb/m)
Erasing System :	AC erase	Channel Separation :	30 dB or more (at 1 kHz)
Erase Ratio :	65 dB or more (at 1 kHz)	Cross Talk :	60 dB or more (at 1 kHz)
Frequency Response :		Power Supply :	AC 120V, 60 Hz (U, C)
NOR-I :	20 Hz-19 kHz		AC 100-110V/115-127V/
	30 Hz-17 kHz ± 3 dB		200-220V/230-250V,
	25 Hz-18 kHz*		50/60 Hz (W)
CrO ₂ -II :	20 Hz-21 kHz		AC 220V, 50 Hz (FS)
	30 Hz-18 kHz ± 3 dB		AC 240V, 50 Hz (BS, AU)
	25 Hz-19 kHz*	Power Consumption :	29W
FeCr-III :	20 Hz-19 kHz	Dimensions :	110(H) $\times$ 435(W) $\times$ 282(D) mm
	30 Hz-17 kHz ± 3 dB	Weight :	6.3 kg
	25 Hz-18 kHz*	Motor :	FG Servomotor $\times$ 1
METAL-IV :	20 Hz-21 kHz		DC motor $\times$ 1
	30 Hz-19 kHz ± 3 dB	Heads :	1.4mm gap Metal R & P head (ferrite)
	25 Hz-20 kHz*		Ferrite guard Metal erase head (Permalloy)
S/N (Signal to Noise Ratio) :			
Dolby NR OFF :	61 dB (Weighted A, Reference 3% THD, Metal tape)		
	61 dB*		
Dolby B NR ON :	69 dB (Weighted A, Reference 3% THD, Metal tape)		
	69 dB*		

* According to DIN 45 500

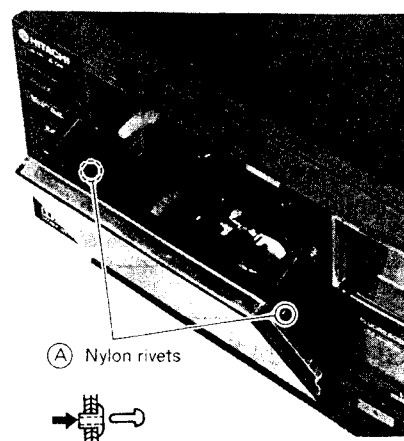
DISASSEMBLY

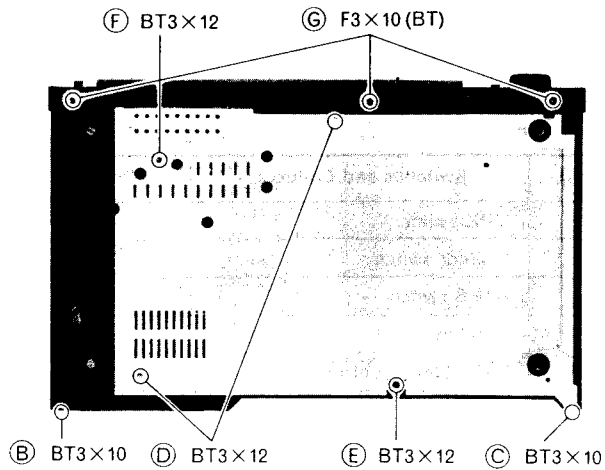
1. Cassette door

Depress the eject button to open the cassette door.
Remove (A) (two) nylon rivets and remove the cassette door.

Note :

The photos used here show the [W] model unit.





2. Upper cover

Remove (B) and (C) (two) screws.

3. Bottom cover

Remove (C), (D), (E) and (F) (five) screws.

4. Front panel

Remove (G) and (H) (eight) screws.

5. Cassette chassis

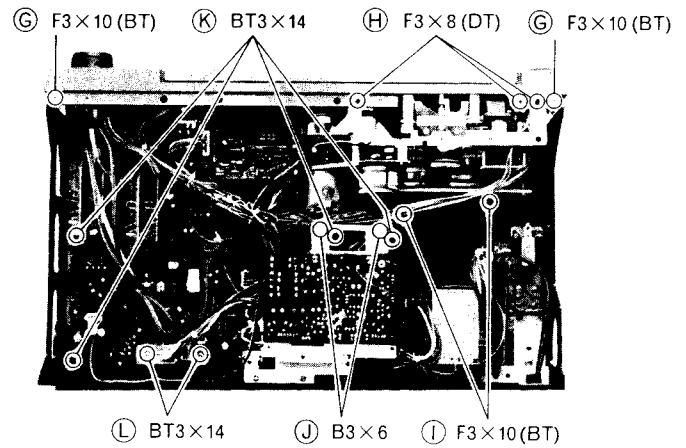
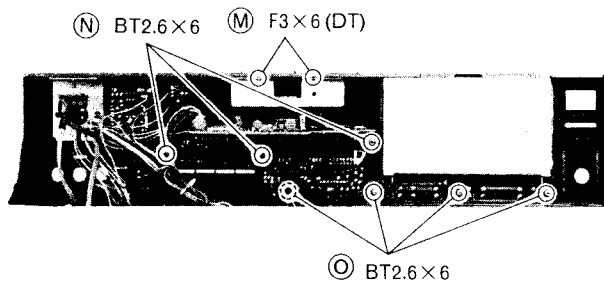
After removing the front panel, remove (F) and (I) (three) screws.

6. Power PC board

Remove (J) (two) screws and open the PC board.

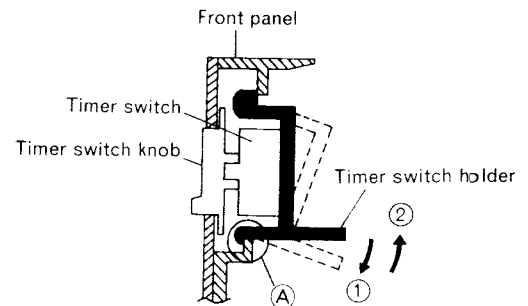
7. Main PC board

After removing the front panel, remove (E), (K) and (L) (seven) screws.



8. Timer switch

Press the projection of the timer switch holder in the direction of the arrow (1) to remove the timer switch. Engage section (A) and then press the switch holder in the direction of the arrow (2) to install the timer switch.



9. Meter PC board assembly

Remove (M) (two) screws.

10. Counter PC board

Remove (N) (three) screws.

11. Function switch PC board

Remove (O) (four) screws.

ADJUSTMENT

Perform the following adjustments in the sequence stated after cleaning the heads, pressure rollers, and capstans with a head cleaning stick moisted in alcohol. Also, unless otherwise specified, set the switches and controls to the positions indicated in the table.

Symbol No.	Switches and Controls	Position	Symbol No.	Switches and Controls	Position
S1	Input select switch	LINE	S7	MPX switch	OFF
S2	Tape select switch	NOR-I	S8	Monitor switch	TAPE
S3	Auto/memory REW switch	OFF	S109	ATRS switch	OFF
S4	Timer switch	OFF	S111	Fixed switch	ON
S5	Dolby NR switch	OFF	RV1L, R	Record level controls	MAX.
S6	Dolby NR B/C switch	B	RV2L, R	Output level control	MAX.

* According to DIN 45 500

Item	Adjustments	Measuring Instrument and Connection			Check Tape	Mode	Adjusted Position	Adjusted Value	Remarks
		Measuring Instrument	Input Terminal	Output Terminal					
1	Tape speed	Frequency counter	—	LINE OUT	MTT-111, 3000 Hz (3150 Hz*)	Playback	Semi-variable resistor in the motor	3000 Hz +20 Hz - 5 Hz (3150 Hz*)	See Note 1
2	(1) Tilt and height of the head	Head adjusting jig	—	—	—	Playback	Screw (A), (B), (C)	—	See Note 2
	(2) Head azimuth	VTVM	—	LINE OUT	MTT-114 (10 kHz)	Playback	Screw (C)	Output Max.	See Note 3
3	Digital peak meter	Audio oscillator (400 Hz) Attenuator VTVM	LINE IN	TP1L, R	—	—	RT303L, R	0 dB indicators flash	See Note 4
4	Playback gain	VTVM	—	TP2L, R	MTT-150, 400 Hz, 20m Maxwell	Playback	RT301L, R	580mV	See Note 5

Note :

- Adjust within 30 sec. after heat-running for more than 20 minutes.
- Use the Hitachi head adjusting jig and instructions (consult nearest Hitachi office) to obtain the correct head height, tilt and azimuth. This adjustment has to be done alternately.
- When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.
- Set the monitor switch to the SOURCE position.
 - Feed a 400 Hz signal to the LINE IN jacks and adjust the audio oscillator output so that the level of TP1L, R becomes 580mV.
 - Then, adjust the attenuator to lower the output level by 0.5 dB and adjust RT303L, R so that 0 dB indicators of the digital peak meter flash.
 - Adjust the attenuator to increase the output level by 0.5 dB and confirm 0 dB indicators of the digital peak meter light up.
- Playback a test tape (MTT-150, 400 Hz 20m Maxwell) and adjust RT301L, R so that the level of TP2L, R becomes 580mV.

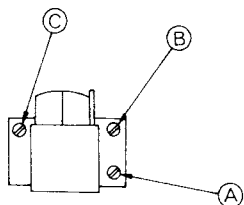


Fig. 1

ATRS circuit adjustment

Item	Adjustments	Measuring Instrument and Connection			Check Tape	Mode	Adjusted Position	Adjusted Value	Remarks
		Measuring Instrument	Input Terminal	Output Terminal					
1	Bias current	· Audio oscillator (1.5 kHz/15 kHz, 0 dB–23 dB) · Attenuator · VTVM	LINE IN	LINE OUT	Hitachi UD C-90 tape	Record	RT103L, R	Output difference within ± 0.5 dB	See Note 1
2	Bias trap	Set RV1L, R (Record level control) to Minimum.							See Note 2
		· VTVM	—	TP3L, R	—	Record	L108L, R	Min.	
3	Record level	· Audio oscillator (1 kHz, 0 dB–23 dB) · Attenuator · VTVM	LINE IN	LINE OUT	Hitachi UD C-90 tape	Record	RT102L, R	Output difference within ± 0.2 dB	See Note 3
4	AF oscillator	Set the AUTO/MEMORY REW switch (S3) to PLAY position and connect a diode (1S2473 or 1S2076) as shown in Fig. 2. Then, set the power switch to ON. (Microprocessor test program is performed)							See Note 4
		· VTVM	—	TP4	—	—	RT101	Output difference within ± 0.3 dB	
5	A/D conversion	· Audio oscillator (1 kHz, 0 dB–23 dB) · Attenuator · VTVM	LINE IN	LINE OUT	Hitachi UD C-90 tape	Record	RT302L, R	0 dB ± 0.3 dB	See Note 5

Note :

- 1) Set the monitor switch to the SOURCE position and feed a 1.5 kHz signal to the LINE IN jacks in the recording mode.
- 2) Adjust the audio oscillator output so that the digital peak meter indicates 0 dB. Then, adjust the attenuator to lower the output level by 23 dB.
- 3) Set the monitor switch to the TAPE position and read the playback output level of LINE OUT jacks.
- 4) Then, set the audio oscillator frequency to 15 kHz and read the playback output level of LINE OUT jacks.
- 5) Adjust RT103L, R so that the output level difference between two frequencies is within ± 0.5 dB.
2. With the condition shown in item 1, set RV1L, R (Record level control) to Minimum. Then, adjust L108L, R so that the level of TP3L, R becomes minimum.
3. 1) Set the monitor switch to the SOURCE position and feed a 1 kHz signal to the LINE IN jacks in the recording mode.
- 2) Adjust the audio oscillator output so that the digital peak meter indicates 0 dB. Then, adjust the attenuator to lower the output level by 23 dB.
- 3) Set the monitor switch to the TAPE position and adjust RT102L, R so that the output level difference between SOURCE and TAPE is within ± 0.2 dB at LINE OUT jacks.
4. 1) Connect the VTVM to TP4, press the PLAY button and read the output of the 1 kHz signal.
- 2) Next, press the REC button, read the output of the 12 kHz signal and adjust RT101 so that the output difference between 1 kHz signal and 12 kHz signal is within ± 0.3 dB.
- 3) After adjustment, remove a diode as shown in Fig. 2.

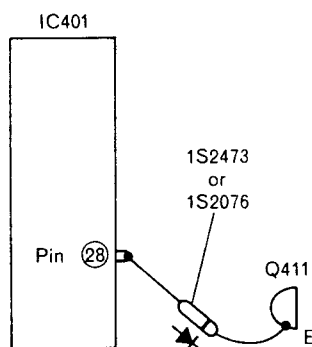


Fig. 2

5. 1) Perform the ATRS test using Hitachi UD(C-90) tape.
- 2) Set the monitor switch to the SOURCE position and feed a 1kHz signal to the LINE IN jacks in the recording mode.
- 3) Adjust the audio oscillator output so that the digital peak meter indicates 0 dB. Then, adjust the attenuator to lower the output level by 23 dB.
- 4) Read the output of LINE OUT jacks when the monitor switch is changed over, and adjust RT302L, R so that the output when the MONITOR switch is set to TAPE is within ± 0.3 dB with respect to the output when the monitor switch is set to SOURCE.

INSPECTION OF MECHANISM

Check Item			Reference Value	Remarks
1	Pressure roller (Take-up side)	Pressure	420—500g	Measure in playback mode (Fig. 3)
		Driving force	120g or more	
2	Pressure of pressure roller (Supply side)		130—180g	Measure in playback mode (Fig. 4)
3	Pressure of take-up idler		60g or more	Measure in playback mode (Fig. 5)
4	Torque	Take-up	35—65g·cm	
		Fast forward	75—110g·cm	Measure in fast forward mode
		Rewind		Measure in rewind mode
5	Back tension	Supply side	9—12g·cm (See Note 1)	Measure in playback mode (Fig. 6)
		Take-up side	1.7—5g·cm	
6	Brake torque	Supply side	50—100g·cm	Measure in stop mode (Fig. 7)
		Take-up side		
7	Head plate return strength		200g or more	Measure in stop mode (Fig. 8)
8	Head plate play lock allowance		300g or more	Measure in playback mode (Fig. 9)
9	Head plate pressing strength		150g or more	Measure in playback mode (Fig. 10)

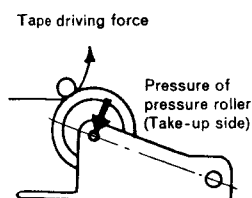


Fig. 3

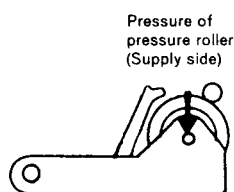


Fig. 4

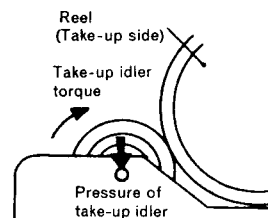


Fig. 5

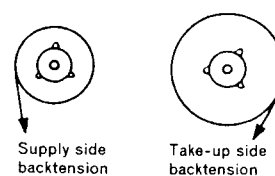


Fig. 6

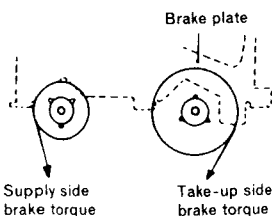


Fig. 7

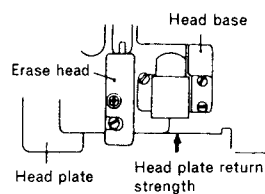


Fig. 8

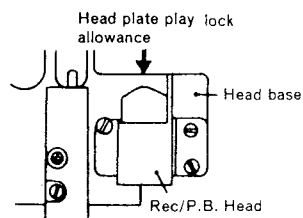


Fig. 9

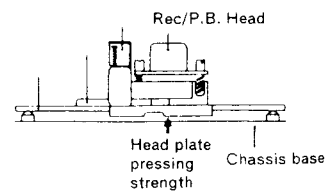
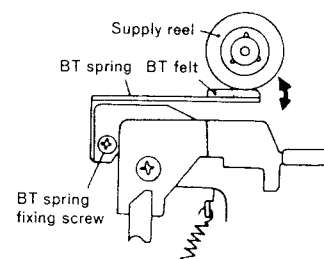


Fig. 10

Note 1. Back tension adjustment

When the supply back tension is out of the reference value, loosen the BT spring fixing screw and move the BT spring up and down to adjust so that the back tension is within the reference value.



LUBRICATIONS

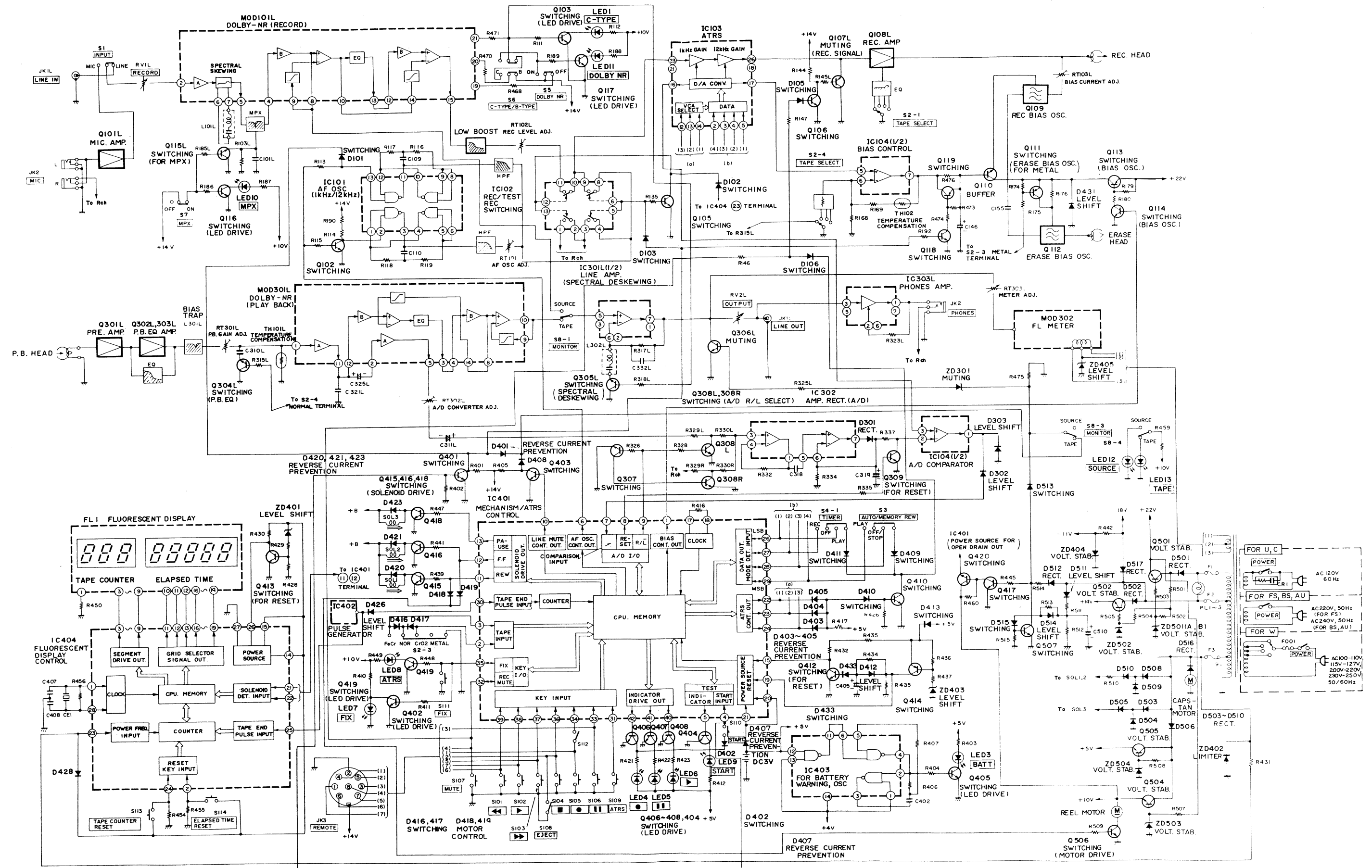
Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point.

Lubricate the respective parts listed once every 1000 hours or once a year under normal conditions of use.

Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

Lubrication		Oil or Grease
Rotary section	Metal and metal	Pan motor oil (10W-40)
	Mold and metal	Sonic slider oil (#1600)
Sliding section	Metal and metal	Hitasol (MO-138)
	Mold and mold Mold and metal	White grease (FL-LUBE-A)
Spring resonance prevention		Froil (GB-TS -1)

BLOCK DIAGRAM



SCHEMATIC DIAGRAM

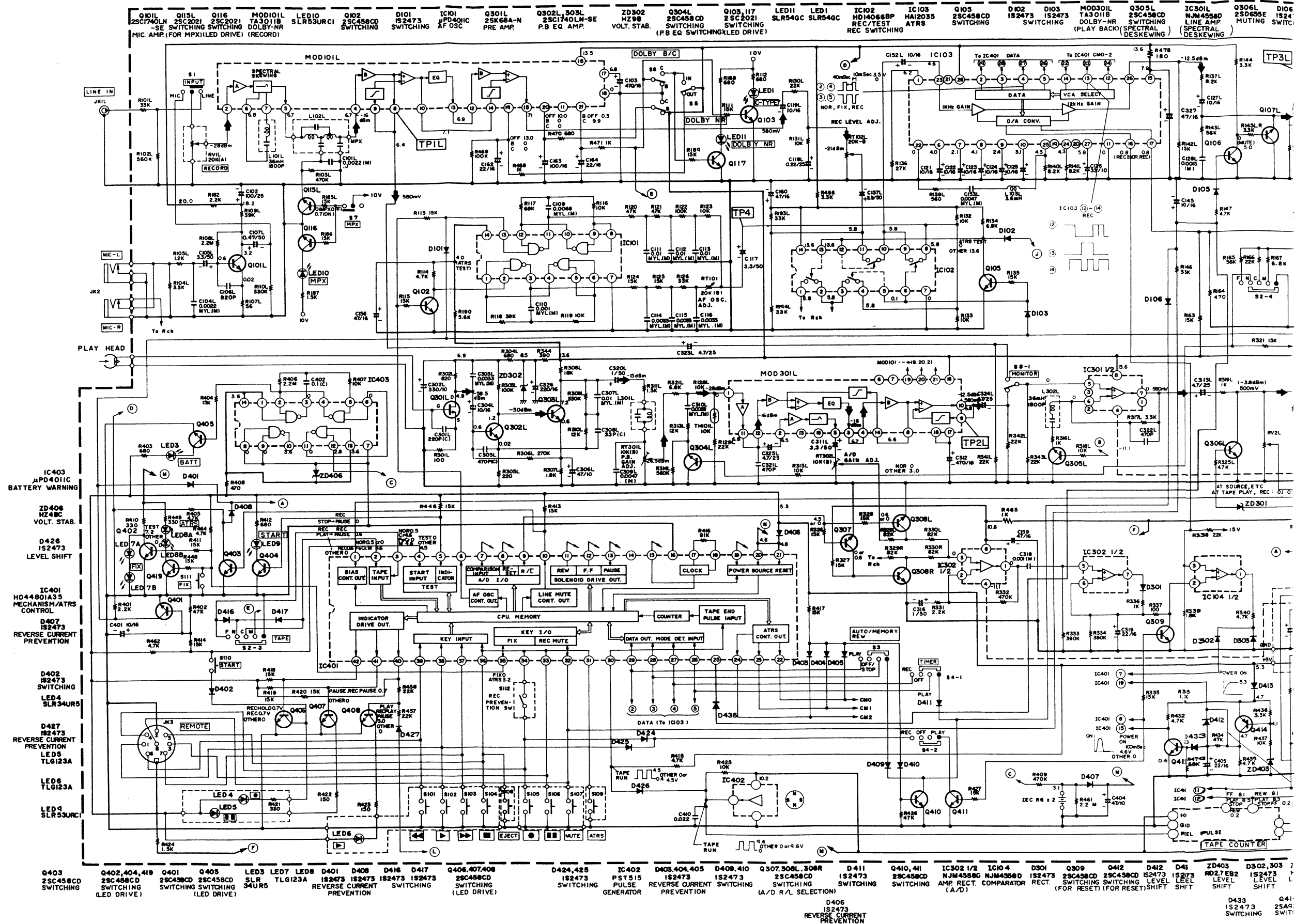
Note

1. Voltage measured at base of chassis with minimum volume control and no signal.
2. Nomenclature of Resistors and Capacitors.

Circuit No.	
Value	No indicated Ω (Ohm) M : 1000 k Ω
Tolerance	No indicated $\pm 5\%$ K : $\pm 10\%$ M : $\pm 20\%$
Wattage	No indicated $\frac{1}{4}W$
Sort	No indicated Carbon film RC : Composition RW : Wire wound RS : Oxide metal film RN : Fixed metal film

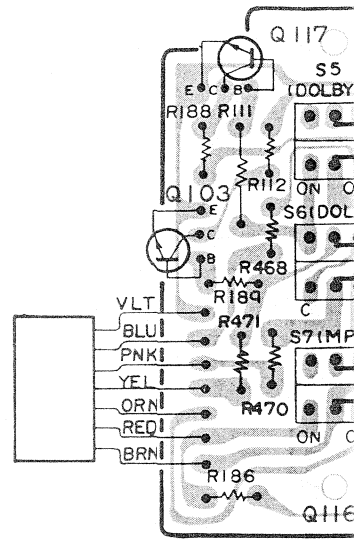
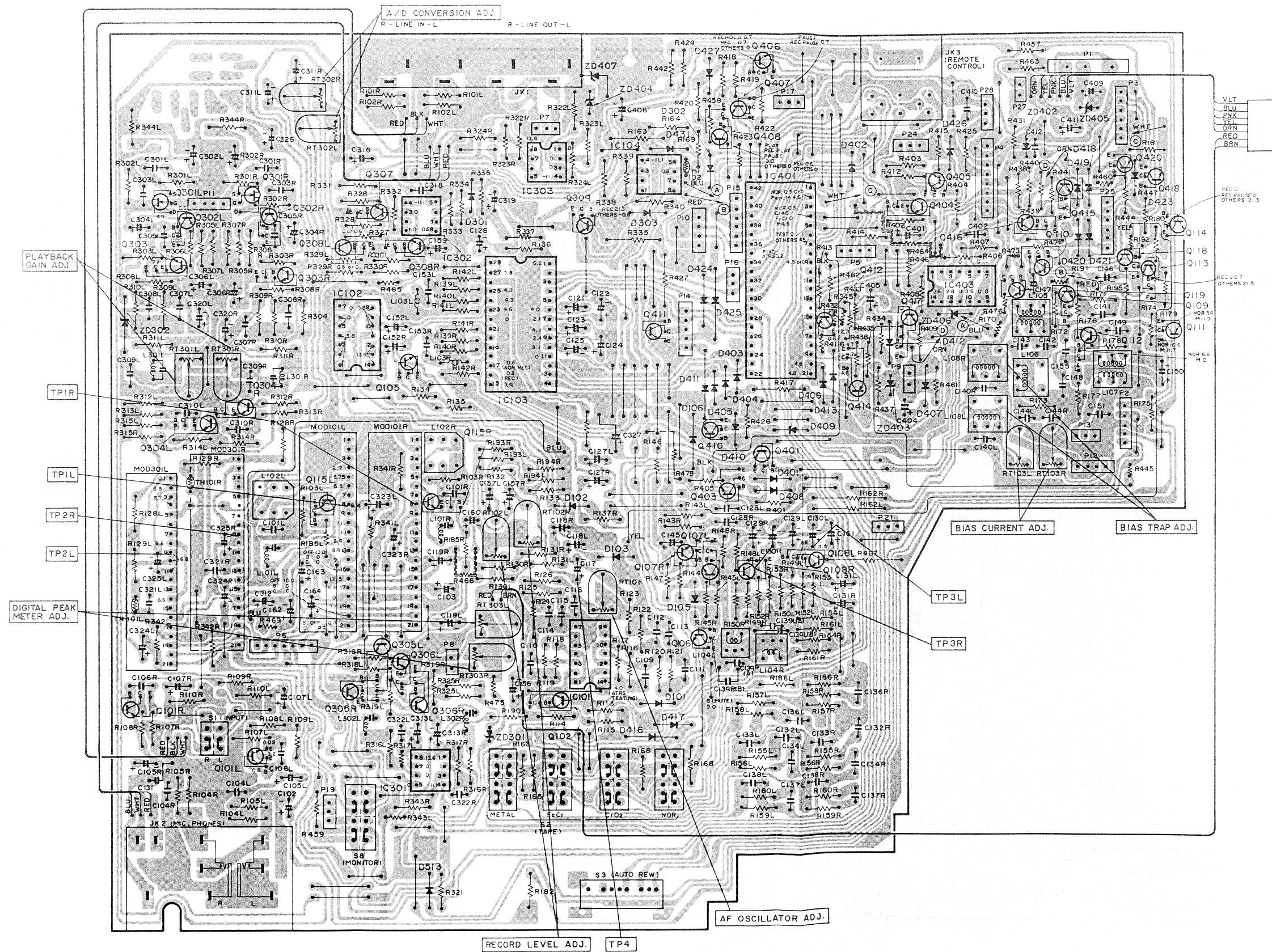
Circuit No.	
Value	No indicated μF P : PF
Tolerance	No indicated $\pm 10\%$ J : $\pm 5\%$ M : $\pm 20\%$ Z : $\pm 80\%$ C : $\pm 0.5pF$ D : $\pm 0.25pF$
Sort	Ceramic Electrolytic Mylar Polyester Styrol
Voltage	No indicated 50WV

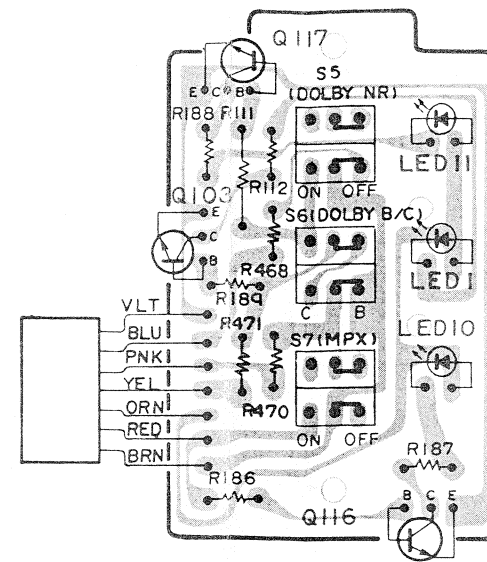
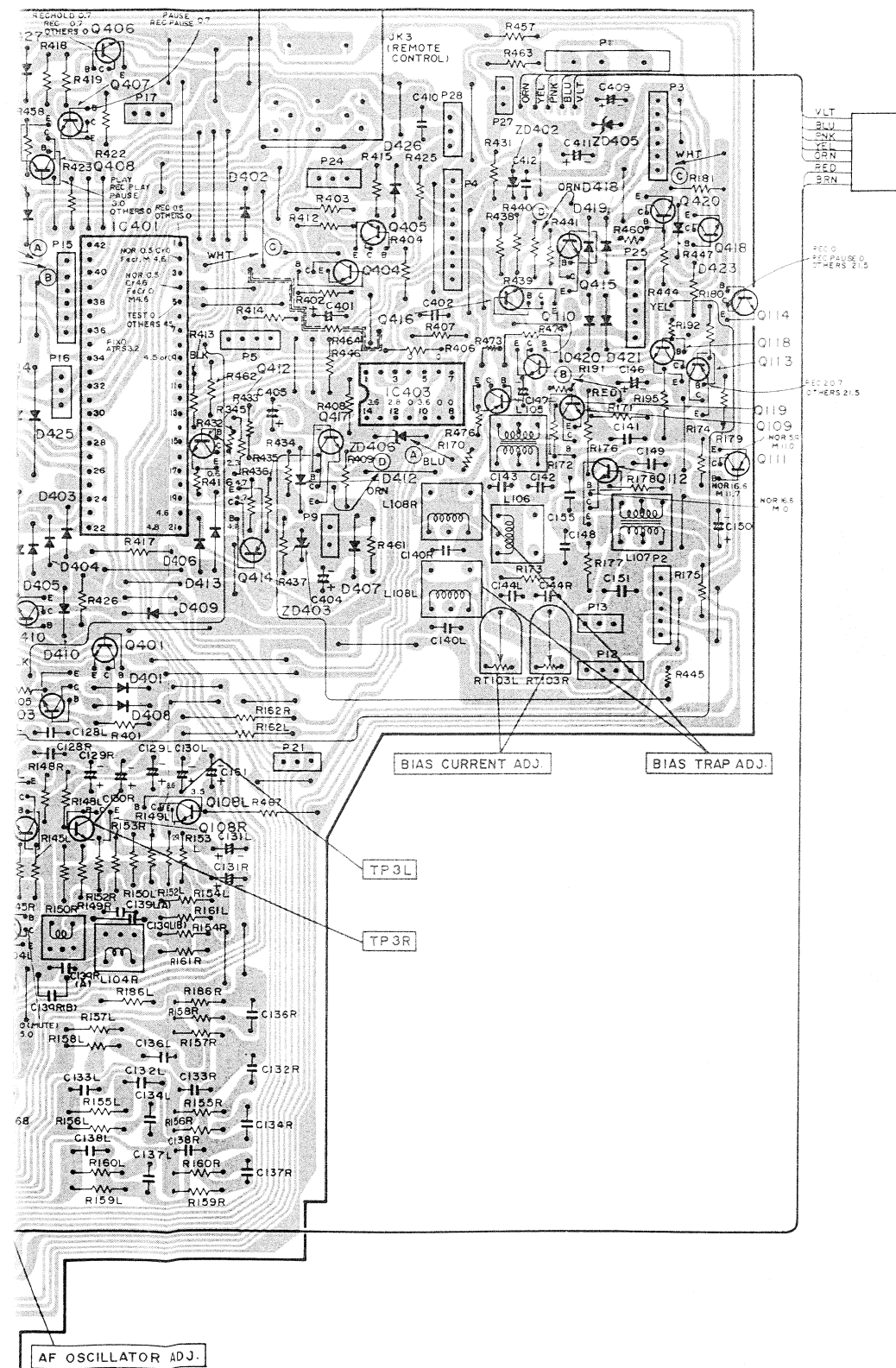
3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked with *, use specified ones stated on parts list since required temperature characteristics.



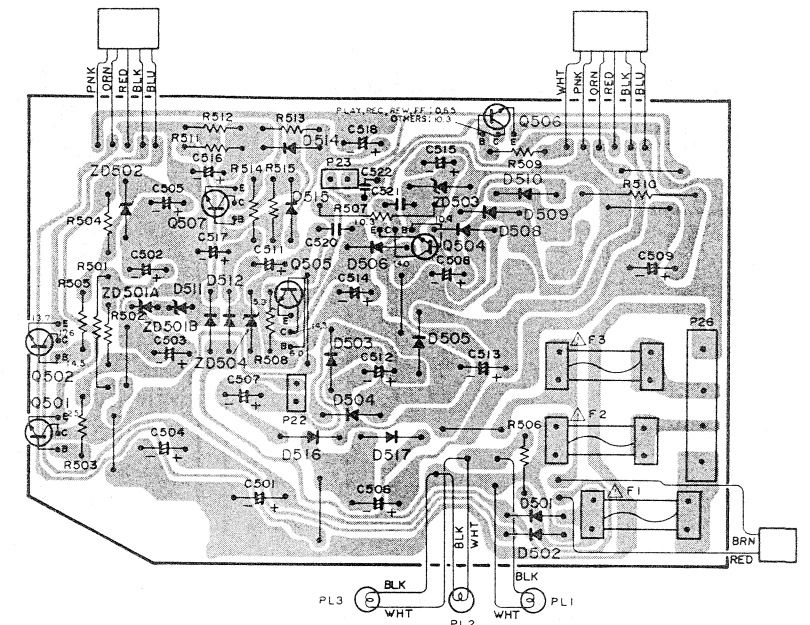


CIRCUIT BOARD DIAGRAM

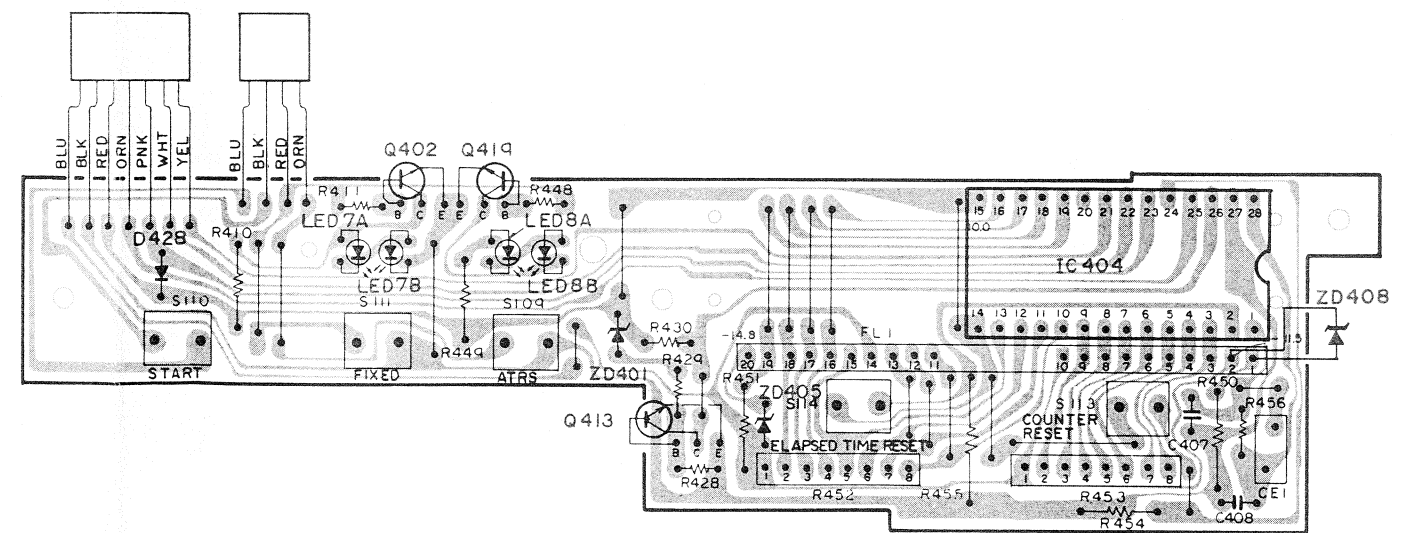




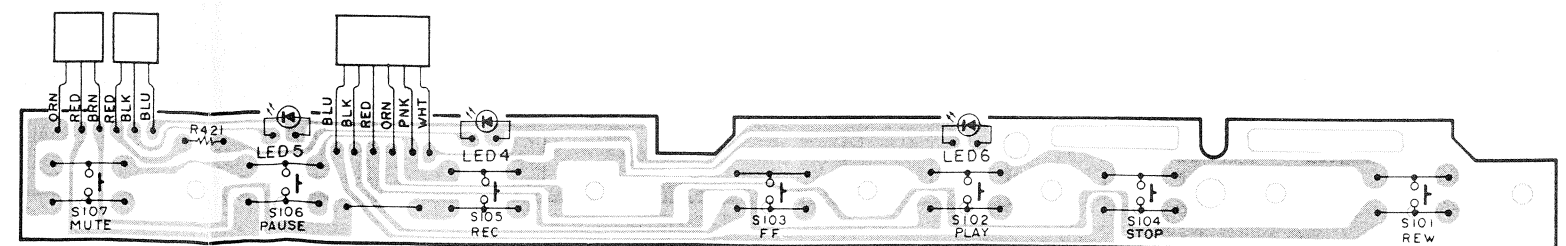
DOLBY SWITCH



POWER

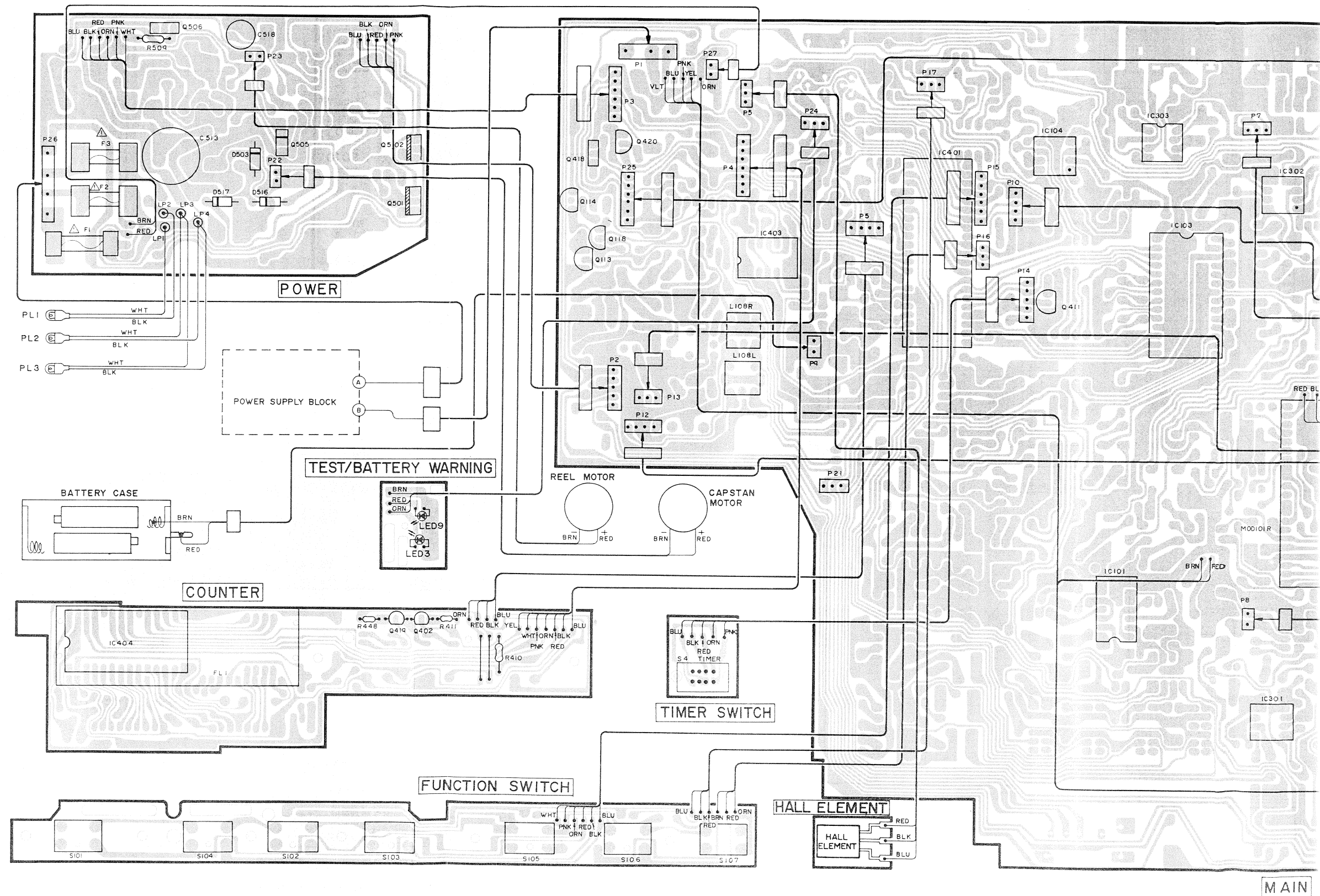
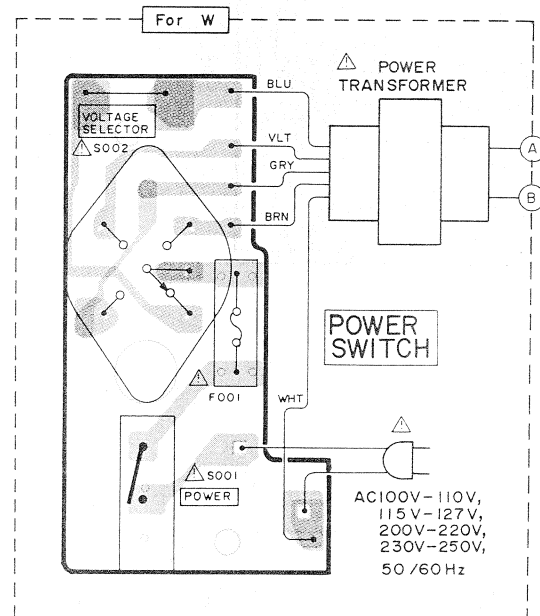
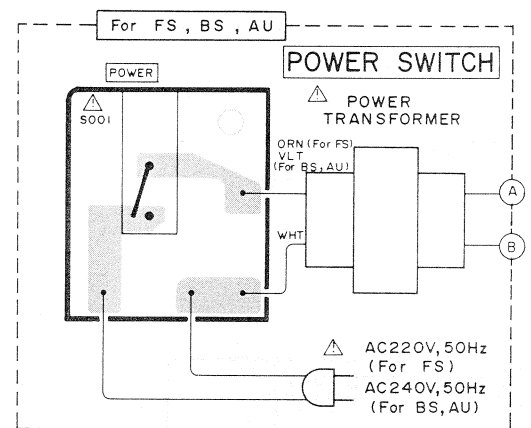
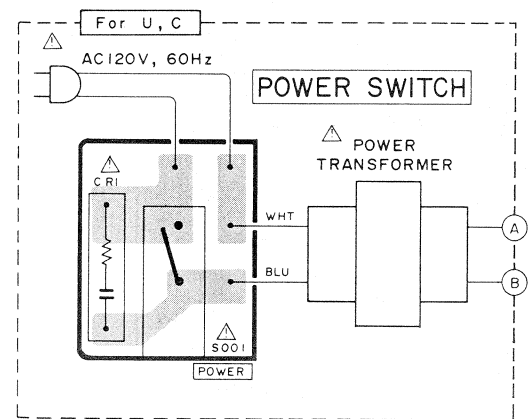


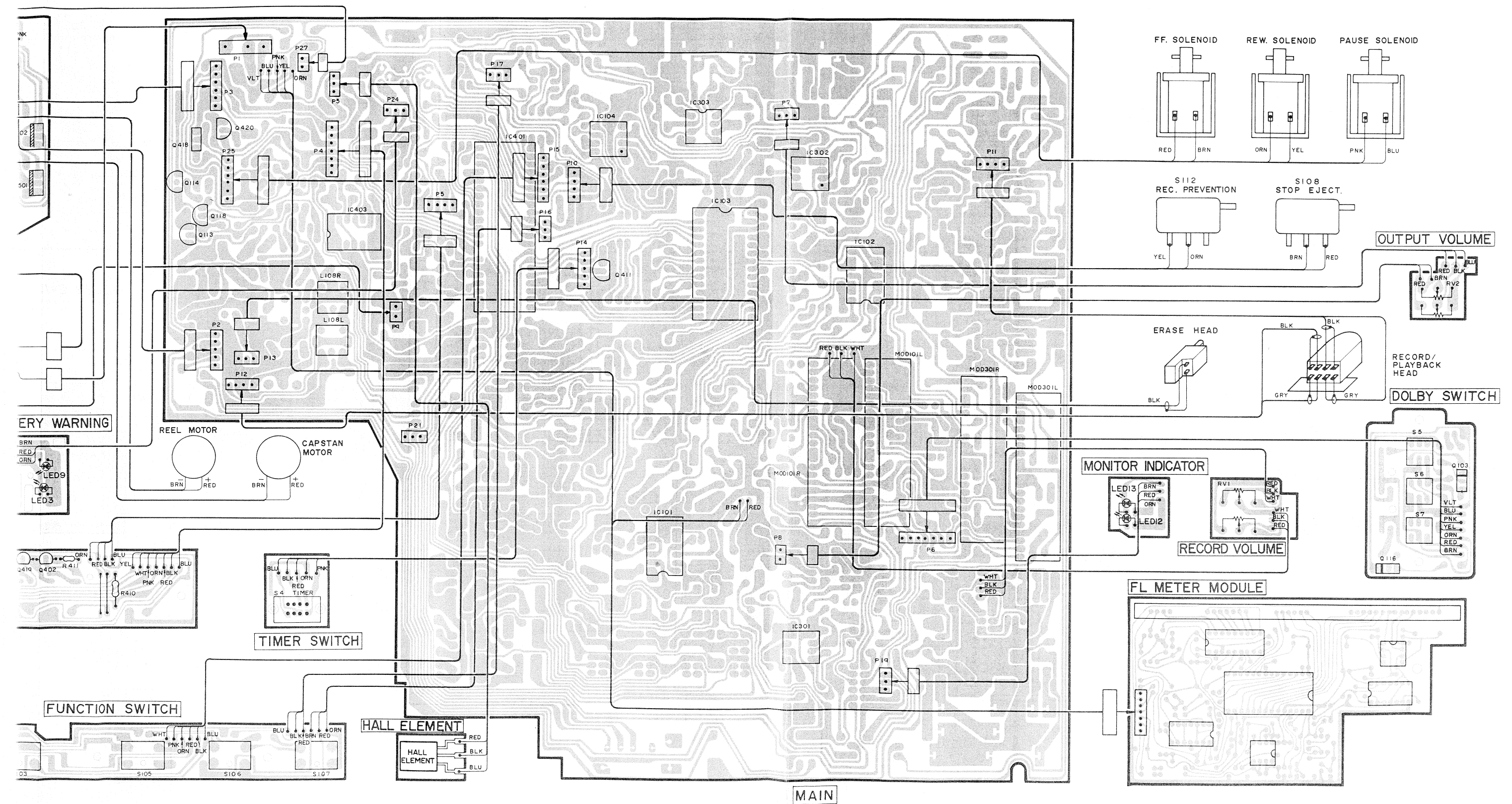
COUNTER



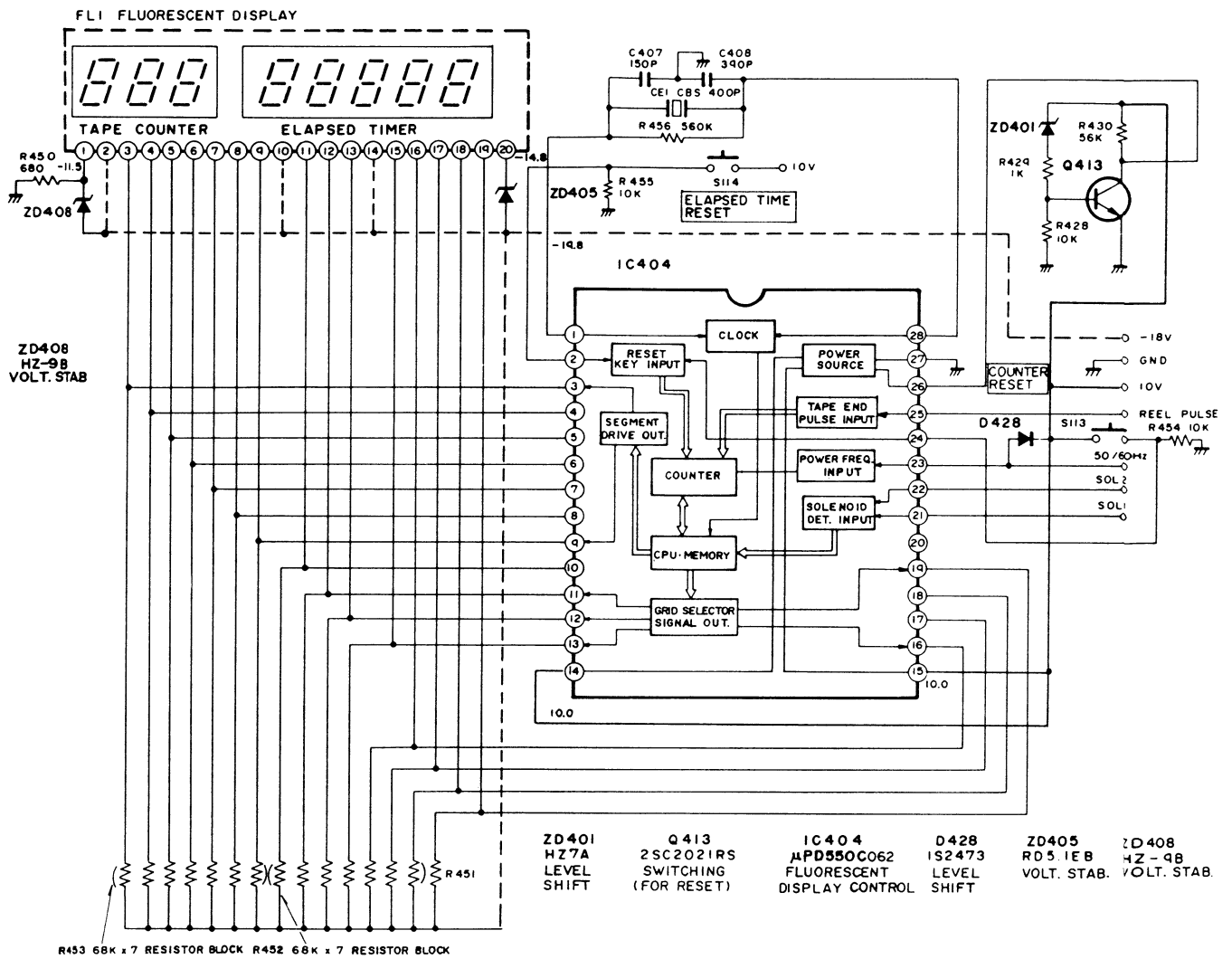
FUNCTION SWITCH

WIRING DIAGRAM



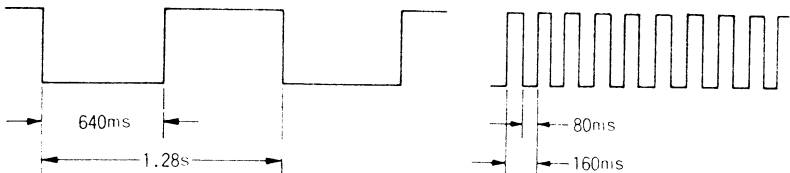


SCHEMATIC DIAGRAM (Counter PC Board Section)



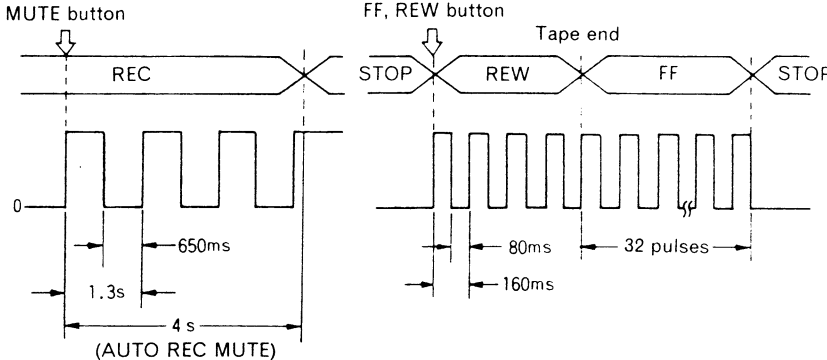
IC PIN FUNCTION TABLE

1. IC401 (HD44801A35 for mechanism/ATRS control)

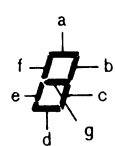
Pin No.	Pin Symbol	Function															
1	BIAS	Control output pin to operate the bias oscillation circuit. Outputs Lo potential normally and Hi potential in the REC mode and the REC-PAUSE mode after recording. Outputs after elapse of the inhibit time of 120 ms when the mode is changed from STOP, PLAY or PAUSE, and outputs after elapse of the inhibit time of 820 ms when the mode is changed from FF or REW.															
2 3	TAPE SELECT 1 TAPE SELECT 2	Tape select switch (S2) position detection input pin. Detects the tape select switch position according to the truth table shown below and changes over the output data. <table><tr><th>Switch position Input pins</th><th>NORMAL</th><th>FeCr</th><th>CrO₂</th><th>METAL</th></tr><tr><td>Pin ②</td><td>0</td><td>1</td><td>0</td><td>1</td></tr><tr><td>Pin ③</td><td>0</td><td>0</td><td>1</td><td>1</td></tr></table>	Switch position Input pins	NORMAL	FeCr	CrO ₂	METAL	Pin ②	0	1	0	1	Pin ③	0	0	1	1
Switch position Input pins	NORMAL	FeCr	CrO ₂	METAL													
Pin ②	0	1	0	1													
Pin ③	0	0	1	1													
4	TEST START	- ATRS test start detection input pin. Inputs Hi potential normally and inputs Lo potential by the button operation in the REC, REC-PAUSE or REC-HOLD mode, to detect the ATRS test start. The ATRS test starts actually when the input is detected during the REC or REC-PAUSE mode. - Outputs Lo potential when executing the ATRS test and outputs Hi potential normally.															
5	TEST INDI.	Test indicator drive output pin. Outputs Lo potential normally and outputs the flashing pulse with 1.28 sec. period when executing the ATRS test. When error occurs during the ATRS test, the flashing pulse with 160 ms period is output as error indication. This error indication continues until the play button or pause button key input is given. 															
6	AF OSC (1 kHz/12 kHz)	AF signal oscillator control output pin. Outputs Hi potential until ATRS test starts when power is ON, and outputs Lo potential when recording the 12 kHz signal during execution of the ATRS test. It is set to the Lo potential output mode after ATRS test is completed.															
7	A/D COMP.	- A/D comparator output input pin. - Detects the inversion output (fall signal from Hi to Lo potential) of the A/D comparator during execution of the ATRS test.															
8	A/D RESET	- A/D comparator circuit reset control output pin. - Outputs Lo potential in other modes than the ATRS operation, and outputs Hi potential with 80 ms width for approx. 3 sec. after power is supplied or just after scanning the A/D comparison reference voltage during execution of the ATRS test to reset the test sample hold.															
9	A/D SELECT	- A/D comparison circuit input (play output signal) channel select control output pin. - When Hi potential is output : R channel - When Lo potential is output : L channel															

Pin No.	Pin Symbol	Function																																							
10	LINE MUTE	LINE amp final stage muting control output pin. Outputs Hi potential during REC, PLAY and REC-PAUSE after recording to mute the play signal of the LINE amp output. Hi potential is output after elapse of the inhibit time of 120 ms during play, after elapse of the inhibit time of 400 ms during record and after elapse of the inhibit time of 1100 ms when changing the mode from FF or REW.																																							
11	REW SOL.	REW solenoid drive output pin. Outputs Lo potential normally and Hi potential during REC, PLAY and REW.																																							
12	FF SOL.	FF solenoid drive output pin. Outputs Lo potential normally and outputs Hi potential during REC, PLAY and FF.																																							
13	PAUSE SOL.	PAUSE solenoid drive output pin. Outputs Lo potential normally and outputs Hi potential during REC-PAUSE mode and PLAY-PAUSE mode.																																							
14	NC	Blank pin.																																							
15	RESET	Initial reset input pin. This pin input is set to Hi potential when power is supplied to perform initial resetting.																																							
16	GND	Connected to GND																																							
17 18	OSC 1 OSC 2	The external resonance circuit is coupled with these pins to operate the built-in clock oscillation circuit which is the reference of microprocessor operation. The oscillation frequency is set to 400 kHz.																																							
19	HALT	HALT pin. This pin changes from Lo potential to Hi potential when power is supplied and the program of the microprocessor is executed. It is set to Lo potential when power is set to OFF and the execution of the program stops and is held.																																							
20	TEST	Microprocessor test pin. Connected to Vcc pin ⑳ because this is not used.																																							
21	Vcc	Power pin. Applies +5V.																																							
22 23 24	VCA SELECT 0 VCA SELECT 1 VCA SELECT 2	- ATRS IC (HA12035) control output pins. Output during REC, REC-PAUSE and REC-HOLD, and designate the object of the ATRS IC internal circuit to be controlled by the control data output from the data output pins ㉔ ~ ㉗. These outputs are composed of the 3-bit signal. <table><tr><th colspan="3">Output pins</th><th rowspan="2">Designation function</th></tr><tr><th>㉔</th><th>㉓</th><th>㉒</th></tr><tr><td>0</td><td>0</td><td>0</td><td>Designates that data has no meaning.</td></tr><tr><td>0</td><td>0</td><td>1</td><td>Designates that it is 1 kHz, Lch data.</td></tr><tr><td>0</td><td>1</td><td>0</td><td>Designates that it is 14 kHz, Lch data.</td></tr><tr><td>0</td><td>1</td><td>1</td><td>Designates that it is bias data.</td></tr><tr><td>1</td><td>0</td><td>0</td><td>Designates that 14 kHz, R ch data.</td></tr><tr><td>1</td><td>0</td><td>1</td><td>Designates that it is 1 kHz, R ch data.</td></tr><tr><td>1</td><td>1</td><td>0</td><td>Designates that it is A/D comparison reference voltage.</td></tr><tr><td>1</td><td>1</td><td>1</td><td>Designates to clear all data.</td></tr></table> - Auto/memory rewind switch and timer switch position detection output pin. Outputs Hi when detecting switch position.	Output pins			Designation function	㉔	㉓	㉒	0	0	0	Designates that data has no meaning.	0	0	1	Designates that it is 1 kHz, Lch data.	0	1	0	Designates that it is 14 kHz, Lch data.	0	1	1	Designates that it is bias data.	1	0	0	Designates that 14 kHz, R ch data.	1	0	1	Designates that it is 1 kHz, R ch data.	1	1	0	Designates that it is A/D comparison reference voltage.	1	1	1	Designates to clear all data.
Output pins			Designation function																																						
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1	1	1	Designates to clear all data.																																						

Pin No.	Pin Symbol	Function																														
25	IC MUTE	• IC muting control output pin.																														
26 } 29	DATA 0(LSB) } DATA 3(MSB)	• ATRS IC (HA12035) control output pins. The control data is composed of 4-bit signal and output during REC, REC-PAUSE and REC-HOLD. • Auto/memory rewind switch and timer switch position detection input pins. Input the timer switch position detection signal for 3 sec. after power is supplied, to judge the mode. <table><tr><th colspan="4">Input pins</th><th rowspan="2">Criterion mode</th></tr><tr><th>29</th><th>28</th><th>27</th><th>26</th></tr><tr><td>0</td><td>0</td><td>×</td><td>×</td><td>Test program execution</td></tr><tr><td rowspan="4">DATA2 + DATA3 = 1</td><td></td><td>0</td><td>0</td><td rowspan="2">Timer recording</td></tr><tr><td></td><td>0</td><td>1</td></tr><tr><td></td><td>1</td><td>0</td><td>Timer play</td></tr><tr><td></td><td>1</td><td>1</td><td></td></tr></table>	Input pins				Criterion mode	29	28	27	26	0	0	×	×	Test program execution	DATA2 + DATA3 = 1		0	0	Timer recording		0	1		1	0	Timer play		1	1	
Input pins				Criterion mode																												
29	28	27	26																													
0	0	×	×	Test program execution																												
DATA2 + DATA3 = 1		0	0	Timer recording																												
		0	1																													
		1	0	Timer play																												
		1	1																													
30	REEL PULSE	• Input pin of tape end detection Hall element pulse output. When the take-up reel disk stops rotating, pulse input disappears and tape end is detected with pulse not input for 3 sec. or more during REC and PLAY, and for 1 sec. or more during REW and FF. • Tape count during the memory rewind function operation is done counting the input pulses.																														
31	ATRS	• ATRS mode input pin. Judged as ATRS mode with Lo potential input.																														
32	REC MUTE	• Auto REC MUTE detection input/output pin. When Lo potential is input by the REC-MUTE button operation during outputting Hi potential (during REC or REC-PAUSE mode), it is judged as auto REC MUTE mode and Lo potential is output for approx. 4 sec.																														
33	PAUSE	• PAUSE mode input pin. Judged as PAUSE mode with Lo potential input.																														
34	REC	• REC mode input pin. Judged as REC mode with Lo potential input.																														
35	FIXED	• ATRS FIXED mode input pin. When Lo potential is input, it is judged as FIXED mode and the REC control data output is changed over from the ATRS data to FIXED data. • When the Lo potential is input and it is judged as FIXED mode, Lo potential is output to light the FIXED indicator and makes ATRS indicator go off.																														
36	STOP	• STOP mode input pin. When Lo potential is input, it is judged as STOP mode.																														
37	FF	• FF mode input pin. When Lo potential is input, it is judged as FF mode.																														
38	PLAY	• PLAY mode input pin. When Lo potential is input, it is judged as PLAY mode. • When the timer record or play is set within 3 sec. after power is supplied, Lo potential is output after approx. 3 sec. Outputs Lo potential with approx. 80 ms width simultaneously with the play operation start in the auto rewind play mode. This Lo potential is the one action control signal when the unit is combined with the system component stereo.																														
39	REW	• REW mode input pin. When Lo potential is input, it is judged as REW mode.																														

Pin No.	Pin Symbol	Function
40	PLAY INDI.	- PLAY indicator drive output pin. Flashing pulse is output synchronizing with the reel pulse input during REC and PLAY. When the time of light gone off becomes 500 ms, Hi potential is output regardless of presence/absence of the reel pulse input. - Outputs Hi potential during REC-PAUSE and PLAY-PAUSE. - When the REC and PLAY buttons are pressed simultaneously within 3 sec after power is supplied and reset is completed, or during the timer recording or play, flashing pulse is output with 180 ms period for 3 sec. after resetting, and Hi potential is output after elapse of 3 sec.
41	PAUSE INDI.	- PAUSE indicator drive output pin. Outputs Hi potential during REC-PAUSE and PLAY-PAUSE. - Flashing pulse is output with 1.3 sec. period during the AUTO REC MUTE, and Hi potential is output after AUTO REC MUTE is completed. - Flashing pulse is output with 160 ms period during the timer stand-by mode and the Lo potential is output after the mode is complete. 
42	REC INDI.	- REC indicator drive output pin. Outputs Hi potential during REC, REC-PAUSE and REC-HOLD. - When the REC and PLAY buttons are pressed simultaneously within 3 sec. after power is supplied and resetting is complete or during the timer recording, flashing pulse is output with 180 ms period for 3 sec. after resetting is completed, and Hi potential is output after 3 sec.

2. IC404 (μ PD550C 062, for counter with stopwatch)

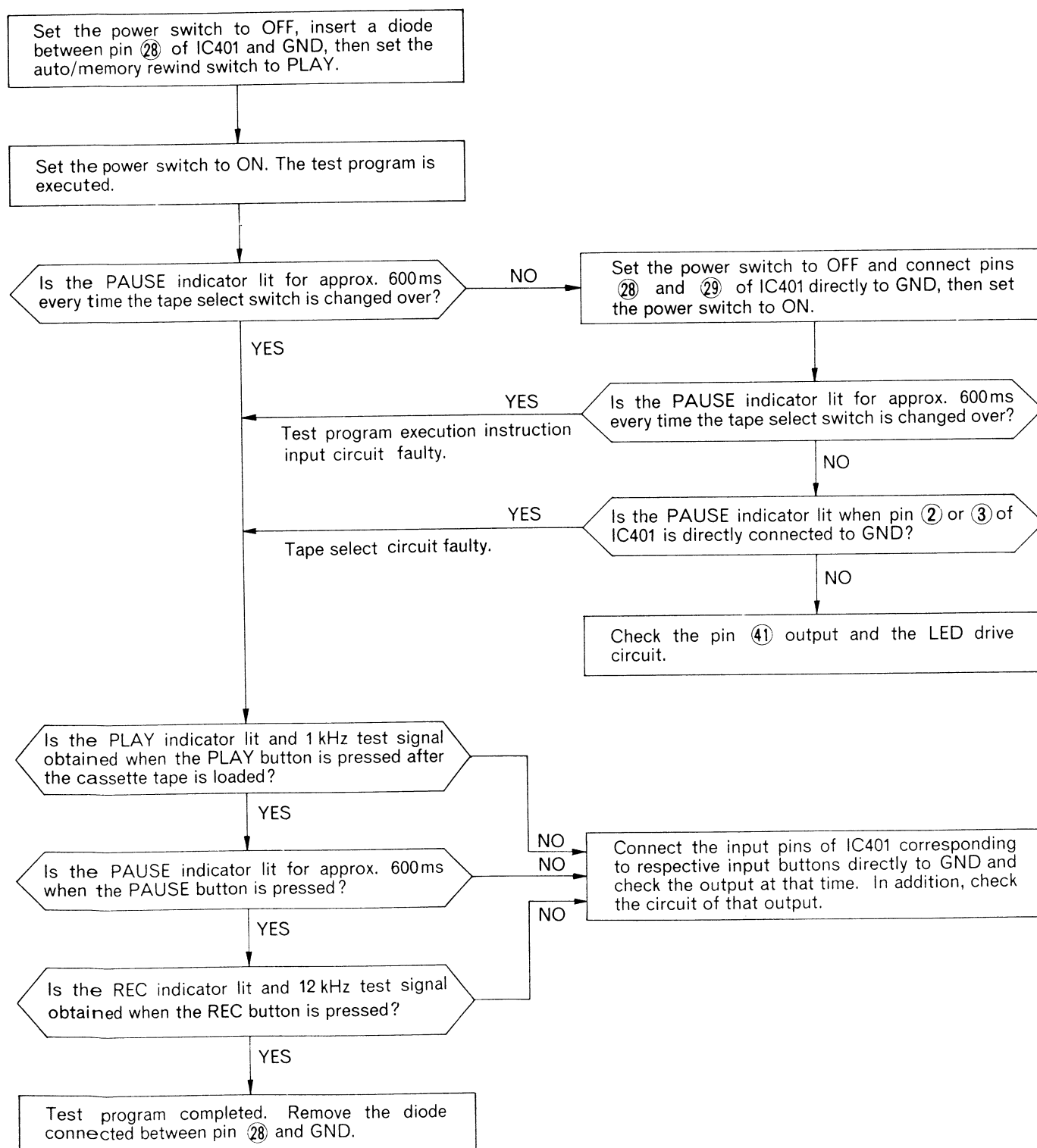
Pin No.	Pin Symbol	Function																																																																																																
1	CLOCK 1	• The external resonance circuit is coupled with these pins to operate the built-in clock oscillation circuit which is the reference of the microprocessor operation, and the oscillation frequency is set to 400 kHz.																																																																																																
28	CLOCK 0																																																																																																	
2	TIMER CLEAR	• Elapsed time indication timer (stopwatch indication) zero clear input pin. Inputs Lo potential normally and outputs Hi potential during button operation.																																																																																																
3 7 9	a f g	• Fluorescent display tube plate segment drive output pins. The Hi potential output segment is lit synchronized with the grid select signal. <table><tr><th>Segment Indication</th><th>a</th><th>b</th><th>c</th><th>d</th><th>e</th><th>f</th><th>g</th></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>2</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td></tr><tr><td>3</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>4</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>5</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td></tr><tr><td>6</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr><tr><td>7</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>8</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr><tr><td>9</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td></tr><tr><td>—</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table> 	Segment Indication	a	b	c	d	e	f	g	0	1	1	1	1	1	1	0	1	0	1	1	0	0	0	0	2	1	1	0	1	1	0	1	3	1	1	1	1	0	0	1	4	0	1	1	0	0	1	1	5	1	0	1	1	0	1	1	6	1	0	1	1	1	1	1	7	1	1	1	0	0	0	0	8	1	1	1	1	1	1	1	9	1	1	1	1	0	1	1	—	0	0	0	0	0	0	1
Segment Indication	a	b	c	d	e	f	g																																																																																											
0	1	1	1	1	1	1	0																																																																																											
1	0	1	1	0	0	0	0																																																																																											
2	1	1	0	1	1	0	1																																																																																											
3	1	1	1	1	0	0	1																																																																																											
4	0	1	1	0	0	1	1																																																																																											
5	1	0	1	1	0	1	1																																																																																											
6	1	0	1	1	1	1	1																																																																																											
7	1	1	1	0	0	0	0																																																																																											
8	1	1	1	1	1	1	1																																																																																											
9	1	1	1	1	0	1	1																																																																																											
—	0	0	0	0	0	0	1																																																																																											
10 7 13 16 7 19	9 f 5 4 f 1	• Fluorescent display tube dynamic drive grid select (for display digit scanning) data output pins, and the display of the Hi potential output digit is lit. <table><tr><th rowspan="2">Display digit Output pin</th><th colspan="3">Tape counter</th><th colspan="5">Elapsed time</th></tr><tr><th>3 rd digit</th><th>2 nd digit</th><th>1 st digit</th><th>10 minute</th><th>1 minute</th><th>—</th><th>10 sec</th><th>1 sec</th></tr><tr><td>1 (pin 19)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><td>2 (pin 18)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr><tr><td>3 (pin 17)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>4 (pin 16)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>5 (pin 13)</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>7 (pin 12)</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>8 (pin 11)</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>9 (pin 10)</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>	Display digit Output pin	Tape counter			Elapsed time					3 rd digit	2 nd digit	1 st digit	10 minute	1 minute	—	10 sec	1 sec	1 (pin 19)	0	0	0	0	0	0	0	1	2 (pin 18)	0	0	0	0	0	0	1	0	3 (pin 17)	0	0	0	0	0	1	0	0	4 (pin 16)	0	0	0	0	1	0	0	0	5 (pin 13)	0	0	0	1	0	0	0	0	7 (pin 12)	0	0	1	0	0	0	0	0	8 (pin 11)	0	1	0	0	0	0	0	0	9 (pin 10)	1	0	0	0	0	0	0	0							
Display digit Output pin	Tape counter			Elapsed time																																																																																														
	3 rd digit	2 nd digit	1 st digit	10 minute	1 minute	—	10 sec	1 sec																																																																																										
1 (pin 19)	0	0	0	0	0	0	0	1																																																																																										
2 (pin 18)	0	0	0	0	0	0	1	0																																																																																										
3 (pin 17)	0	0	0	0	0	1	0	0																																																																																										
4 (pin 16)	0	0	0	0	1	0	0	0																																																																																										
5 (pin 13)	0	0	0	1	0	0	0	0																																																																																										
7 (pin 12)	0	0	1	0	0	0	0	0																																																																																										
8 (pin 11)	0	1	0	0	0	0	0	0																																																																																										
9 (pin 10)	1	0	0	0	0	0	0	0																																																																																										
14	V _{SS}	• Hi side power pin. Applies +10V.																																																																																																
15	TEST	• Microprocessor test pin. Connected to V _{SS} pin because this is not used.																																																																																																
20	NC	• Blank pin.																																																																																																
21 22	FF SOL. REWIND SOL.	• Mechanism operation (solenoid operation) detection input pin. Addition/subtraction to/from the tape counter or addition of the elapsed timer is executed by inputting, and displayed to the fluorescent display tube.																																																																																																

Pin No.	Pin Symbol	Function																				
21 22	FF SOL. REWIND SOL.	<table><tr><th>Pin (21) Potential</th><th>Pin (22) Potential</th><th>Tape counter</th><th>Elapsed timer</th></tr><tr><td>0</td><td>0</td><td>—</td><td>—</td></tr><tr><td>0</td><td>1</td><td>Count subtracted</td><td>—</td></tr><tr><td>1</td><td>0</td><td>Count added</td><td>—</td></tr><tr><td>1</td><td>1</td><td>Count added</td><td>Count added</td></tr></table> • Test program execution instruction input pin. Test program is executed when pin ②② is set to Hi potential input with power ON reset.	Pin (21) Potential	Pin (22) Potential	Tape counter	Elapsed timer	0	0	—	—	0	1	Count subtracted	—	1	0	Count added	—	1	1	Count added	Count added
Pin (21) Potential	Pin (22) Potential	Tape counter	Elapsed timer																			
0	0	—	—																			
0	1	Count subtracted	—																			
1	0	Count added	—																			
1	1	Count added	Count added																			
23	50/60	• Elapsed time indication timer drive power frequency pulse input pin. Inputs power frequency pulse within 2 sec. after power is ON and resetting is complete and executes the 50/60 Hz frequency automatic discrimination. Power ON reset signal Power frequency pulse input signal Within 2 sec Input pulses 10~30 Indicator gone off Indicator lit Power frequency automatic discrimination Discrimination complete																				
24	COUNTER CLEAR	• Tape counter indication reset (zero clear) input pin. Inputs Lo potential normally and inputs Hi potential during button operation.																				
25	REEL PULSE	• Input pin of tape end detection Hall element pulse output signal. Becomes the reference signal of the addition/subtraction count of the tape counter.																				
26	RESET	• Reset pin. This pin is set to Lo potential when power is supplied and initial resetting is performed at the retrailing edge of the pulse.																				
27	V _{GG}	• Power pin. Connected to GND.																				

MICROPROCESSOR TEST PROGRAM

The test programming is stored in the microprocessor of this unit. Judge troubles according to the following procedure when the microprocessor and peripheral circuits are malfunctioning.

IC401

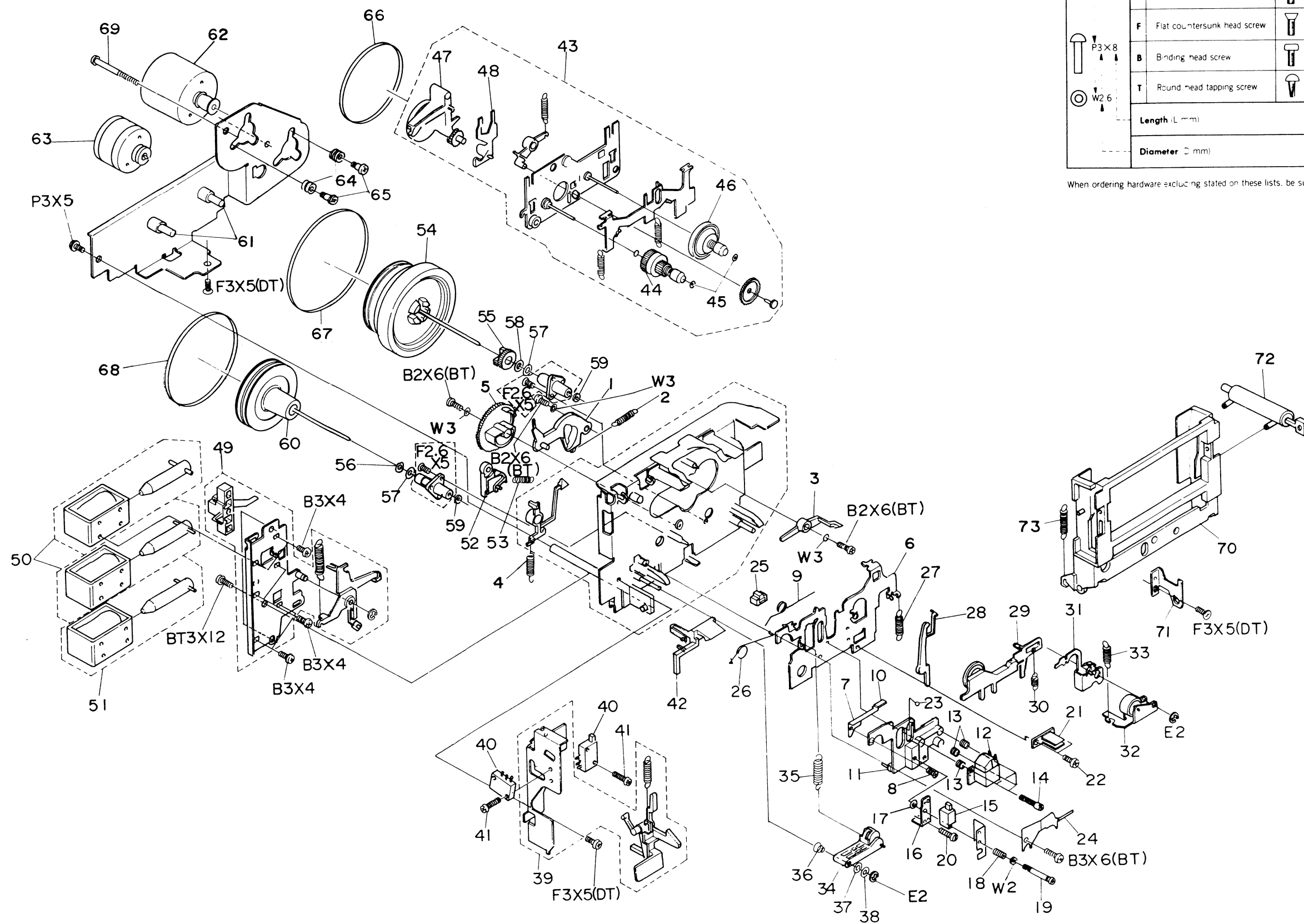


REPLACEMENT PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
CAPACITORS					
△ CR1	0219902	CR PACK 120 OHM 0.0033MF 450V (U)	LED 5	5380711	LED TLG123A
△ CR1	0219907	CR PACK (C)	LED 6	5380711	LED TLG123A
RESISTORS			LED 7AB	5380711	LED TLG123A
RT101	5007478	SEMI VARIABLE 20K OHM	LED 8AB	5380711	LED TLG123A
RT102LR	5007478	SEMI VARIABLE 20K OHM	LED 9	5380482	LED SLR53URC1
RT103LR	5007481	SEMI VARIABLE 100K OHM	LED 10	5380482	LED SLR53URC1
RT301LR	5007477	SEMI VARIABLE 10K OHM	LED 11	5380481	LED SLR-53GC1
RT302LR	5007477	SEMI VARIABLE 10K OHM	LED 12	5380691	LED SLR34UR
RT303LR	5007478	SEMI VARIABLE 20K OHM	LED 13	5380711	LED TLG123A
RV 1	5000845	VARIABLE RESISTOR 20K OHM(A)	LED515	5380101	LED SLP-24B
RV 2	5000872	VARIABLE RESISTOR 10K OHM (B)	MOD101LR	5378063	MODULE TA3011A
R452	5068301	RESISTOR BLOCK R0718	MOD301LR	5378063	MODULE TA3011A
R453	5068301	RESISTOR BLOCK R0718	Q101LR	5321298	TRANSISTOR 2SC1740LN-SE
R510AB	0170407	FUSE RESISTOR 10 OHM+-5% 1/2W	Q102	5320069	TRANSISTOR 2SC458CD
SEMI-CONDUCTORS			Q103	5321663	TRANSISTOR 2SC2021R/S
D101-103	5330573	DIODE 1S2473	Q105	5320069	TRANSISTOR 2SC458CD
D105	5330573	DIODE 1S2473	Q106	5320069	TRANSISTOR 2SC458CD
D106	5330573	DIODE 1S2473	Q107LR	5320069	TRANSISTOR 2SC458CD
D301-303	5330573	DIODE 1S2473	Q108LR	5320069	TRANSISTOR 2SC458CD
D401-413	5330573	DIODE 1S2473	Q109	5322651	TRANSISTOR 2SD667C
D416-419	5330573	DIODE 1S2473	Q110	5323071	TRANSISTOR 2SD947
D420-423	5331671	DIODE DS135D-FA3	Q111	5320603	TRANSISTOR SILICON 2SA673A-C
D424-427	5330573	DIODE 1S2473	Q112	5322651	TRANSISTOR 2SD667C
D428	5330573	DIODE 1S2473	Q113	5320603	TRANSISTOR SILICON 2SA673A-C
D431	5330573	DIODE 1S2473	Q114	5320069	TRANSISTOR 2SC458CD
D433	5330574	DIODE 1S2473	Q115LR	5321663	TRANSISTOR 2SC2021R/S
D436	5330573	DIODE 1S2473	Q116	5321663	TRANSISTOR 2SC2021R/S
D501-506	5331671	DIODE DS135D-FA3	Q117	5321663	TRANSISTOR 2SC2021R/S
D508-510	5331671	DIODE DS135D-FA3	Q118	5320069	TRANSISTOR 2SC458CD
D511	5330573	DIODE 1S2473	Q119	5320603	TRANSISTOR SILICON 2SA673A-C
D512	5331671	DIODE DS135D-FA3	Q301LR	5321506	TRANSISTOR 2SK68A-N
D513	5330573	DIODE 1S2473	Q302LR	5321298	TRANSISTOR 2SC1740LN-SE
D514	5330573	DIODE 1S2473	Q303LR	5321298	TRANSISTOR 2SC1740LN-SE
D516	5331671	DIODE DS135D-FA3	Q304LR	5320069	TRANSISTOR 2SC458CD
D517	5331671	DIODE DS135D-FA3	Q305LR	5320069	TRANSISTOR 2SC458CD
IC101	5359501	IC MPD4011C	Q306LR	5322381	TRANSISTOR 2SD655
IC102	5365491	IC HD14066BP	Q307	5320069	TRANSISTOR 2SC458CD
IC103	5355041	IC HA12035	Q308LR	5320069	TRANSISTOR 2SC458CD
IC104	5350601	IC NJM4558D	Q309	5320069	TRANSISTOR 2SC458CD
IC301	5350601	IC NJM4558D	Q401	5320069	TRANSISTOR 2SC458CD
IC302	5350601	IC NJM4558D	Q402	5320069	TRANSISTOR 2SC458CD
IC303	5352831	IC MPC4557C	Q403-408	5320069	TRANSISTOR 2SC458CD
IC401	5365558	IC HD44801A35	Q410-412	5320069	TRANSISTOR 2SC458CD
IC402	5352911	HALL IC PST515	Q413	5321663	TRANSISTOR 2SC2021R/S
IC403	5359501	IC MPD4011C	Q415	5323071	TRANSISTOR 2SD947
IC404	5359729	IC MPD550C	Q416	5323071	TRANSISTOR 2SD947
LED 1	5380481	LED SLR-53GC1	Q417	5320069	TRANSISTOR 2SC458CD
LED 3	5380482	LED SLR53URC1	Q418	5323071	TRANSISTOR 2SD947
LED 4	5380691	LED SLR34UR	Q419	5320069	TRANSISTOR 2SC458CD
			Q420	5320069	TRANSISTOR 2SC458CD
			Q501	5321301	TRANSISTOR 2SC1061

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
SEMI-CONDUCTORS			MISCELLANEOUS		
Q502	5321301	TRANSISTOR 2SC1061	CE1	5780631	CERAMIC OSCILLATOR 400KHZ
Q504	5320643	TRANSISTOR 2SC1162WT-C	△ F 1	5721161	FUSE 1.6A(U, C)
Q505	5322442	TRANSISTOR 2SD639S	△ F 1	5721063	FUSE 1.25AT (FS, BS, AU, W)
Q506	5323071	TRANSISTOR 2SD947	△ F 2	5721161	FUSE 1.6A(U, C)
Q507	5320069	TRANSISTOR 2SC458CD	△ F 2	5721063	FUSE 1.25AT (FS, BS, AU, W)
TH101LR	5340232	THERMISTOR 112103-2	△ F 3	5721161	FUSE 1.6A(U, C)
TH102	5340231	THERMISTOR 112302-2	△ F 3	5721061	FUSE 1.6A(FS, BS, AU, W)
ZD301	5330841	ZENER DIODE RD5.1E-B	△ FU01	5721063	FUSE 1.25AT (W)
ZD302	5330322	ZENER DIODE SILICON TR-9S	FL1	5310641	FLUORESCENT DISPLAY
ZD401	5330311	ZENER DIODE SILICON HZ7A	JK 1	5676261	PIN JACK ASSEMBLY (LINE IN, LINE OUT)
ZD402	5330322	ZENER DIODE SILICON TR-9S	JK 2	5679823	JACK (MIC, PHONES) (U, C, FS, BS, AU)
ZD403	5331588	ZENER DIODE RD2.7EB2	JK 2	5679825	JACK (MIC, PHONES) (W)
ZD404	5330552	ZENER DIODE HZ11B	JK 3	5677131	8P DIN SOCKET (REMOTE)
ZD405	5330841	ZENER DIODE RD5.1E-B	PL 1-3	5762036	PILOT LAMP
ZD405	5331588	ZENER DIODE RD2.7EB2	S 1	5634363	PUSH SWITCH (INPUT)
ZD406	5330711	ZENER DIODE HZ4BC	S 2	5634433	PUSH SWITCH (TAPE)
ZD407	5330392	ZENER DIODE SILICON HZ6B	S 3	5624281	SLIDE SWITCH (AUTO REW)
ZD408	5330324	ZENER DIODE HZ9B1	S 4	5624131	SLIDE SWITCH (TIMER)
ZD501AU	5330554	ZENER DIODE HZ11AS	S 5-7	5633792	PUSH SWITCH (DOLBY NR, DOLBY B/C, MPX)
ZD502	5330533	ZENER DIODE SILICON HZ-12C	S 6	5634367	PUSH SWITCH (MONITOR)
ZD503	5330555	ZENER DIODE HZ11H2	△ S001	5633842	PUSH SWITCH (POWER) (U, C)
ZD504	5330392	ZENER DIODE SILICON HZ6B	△ S001	5633843	PUSH SWITCH (POWER) (FS, BS, AU, W)
COILS			△ S002	5605083	ROTARY SWITCH (VOLTAGE SELECTOR) (W)
L101LR	5120564	TRAP COIL	S101-107	5633851	PUSH SWITCH (REW, PLAY, FF, STOP, REC, PAUSE, MUTE)
L102LR	5161668	DOLBY FILTER	S109-111	5633671	PUSH SWITCH (ATRS, TEST, FIXED)
L103LR	0333151	PEAKING COIL 36MH	S113	5633671	PUSH SWITCH (COUNTER RESET)
L104LR	5120274	CHOKE COIL	S114	5633671	PUSH SWITCH (ELAPSED TIME RESET)
L105	5260368	OSCILLATOR TRANSFORMER	FOR ACCESSORIES		
L106	5260215	TRAP COIL 33HH	7740321	HEAD CLEANING STICK	
L107	5260368	OSCILLATOR TRANSFORMER	5894163	PATCH CORD	
L108LR	5260215	TRAP COIL 33HH	△ 5652291	SOCKET ADAPTER (W)	
L301LR	5120561	BIAS TRAP COIL			
L302LR	5120564	TRAP COIL			

EXPLODED VIEW (Mechanism-FL-32A)



Type of head				
P	Pan head screw	BT	Binding head tapping screw	
F	Flat countersunk head screw	BL	Bolt	
B	Binding head screw	W	Washer	
T	Round head tapping screw	E	"E" ring	
Length (L mm)				
Diameter (D mm)				

When ordering hardware excluding stated on these lists, be sure to make your orders with type and size

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
FOR CASSETTE DECK ASSEMBLY (FL-32A)			37	7786215	POLYSLIDER WASHER
1	6766551	PLAY ARM	38	7786216	POLYSLIDER WASHER
2	6323761	SPRING	39	7330666	EJECT HOLDER ASSEMBLY
3	6761821	PICK UP ARM	40	5633361	PUSH SWITCH
4	6300981	SPRING	41	0671310	DT SCREW-2.6MMX10MM
5	6430887	PLAY GEAR	42	6761815	RECORD PREVENTION ARM
6	7338843	HEAD PLATE	43	6766586	REEL BASE ASSEMBLY
7	6534811	LEAF SPRING	44	6414431	TURNTABLE ASSEMBLY (SUPPLY)
8	8721104	FLAT SCREW-2MMX4MM	45	7786745	POLYESTER WASHER
9	6546964	SPRING	46	6414213	TURNTABLE ASSEMBLY (TAKE UP)
10	7740394	FELT	47	6761673	FF/REWIND ARM ASSEMBLY
11	6973791	HEAD PLATE	48	6761733	SELECT SLIDER ASSEMBLY
12	5449141	RECORD PLAYBACK HEAD	49	7338993	SOLENOID PLATE ASSEMBLY
13	6321246	HEAD SPRING	50	5642961	DC SOLENOID
14	7781751	SPECIAL SCREW	51	5642962	DC SOLENOID
15	5445313	ERASE HEAD	52	6766562	SEARCH ARM
16	7321221	ERASE HEAD BASE	53	6300596	SPRING
17	7786215	POLYSLIDER WASHER	54	6373974	FLYWHEEL ASSEMBLY(R)
18	6321736	HEAD SPRING	55	6430932	FLYWHEEL GEAR
19	7781921	PAN HEAD SCREW-2MMX25MM	56	7778848	POLYSLIDER WASHER
20	7780554	SCREW	57	7778847	POLY SLIDER WASHER
21	6766501	LEAD WIRE GUIDE	58	7772623	SPRING
22	0671306	DT SCREW-2.6MMX6MM	59	7787566	POLYSLIDER WASHER
23	0948492	BALL - 2MM	60	6373952	FLYWHEEL ASSEMBLY(L)
24	6534801	LEAF SPRING	61	7768682	THRUST SUPPORT
25	6581042	RUBBER FOR RECORD PREVENTION	62	6428154	DC MOTOR ASSEMBLY(PLAY)
26	6547242	SPRING	63	6428141	DC MOTOR ASSEMBLY(F.F./REWIND)
27	6301002	SPRING	64	6576322	RUBBER PLATE
28	6768014	REWIND ARM	65	7539002	SCREW FOR MOTOR MOUNTING
29	6382164	TAKE UP IDLER ASSEMBLY	66	6355193	BELT
30	6320577	SPRING	67	6357403	FLYWHEEL BELT
31	7340621	PAUSE ARM ASSEMBLY	68	6357301	FLYWHEEL BELT
32	7346901	PRESSURE ROLLER ARM ASSEMBLY (R)	69	7781149	TAPPING SCREW-3MMX35MM
33	6321256	SPRING	70	6768333	CASSETTE HOLDER
34	6770496	PRESSURE ROLLER ARM ASSEMBLY(L)	71	7339072	CASSETTE HOLDER SUPPORT
35	6301004	SPRING	72	6763431	DAMPER ASSEMBLY
36	6303731	SPRING	73	6300552	SPRING

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
FOR CASSETTE DECK ASSEMBLY (B)			114	6204311	METER COVER ASSEMBLY
74	7740603	FELT LEG	115 (MOD302)	5310681	FLUORESCENT METER ASSEMBLY
△ 75	6794401	BUSHING (U,C,FS,AU,W)	116	6054861	EJECT BUTTON ASSEMBLY (U,C,FS,BS,AU)
△ 76	6794411	BUSHING (BS)	117	6054862	EJECT BUTTON ASSEMBLY (W)
△ 77	5746443	POWER CORD (U,C)	118	6303115	SPRING FOR EJECT BUTTON
△ 78	5746661	POWER CORD (FS,W)	119	6291713	SLIDE KNOB (U,C,FS,BS,AU)
△ 79	5746342	POWER CORD (BS)	120	6291712	SLIDE KNOB (W)
△ 80	5746571	POWER CORD (AU)	121	6792441	MONITOR INDICATOR ASSEMBLY
△ 81	5213072	POWER TRANSFORMER (U,C)	122	6769021	LED SPACER
△ 82	5213075	POWER TRANSFORMER (W)	123	6769651	LED SPACER (FOR PLAY, REC, PAUSE INDICATOR)
△ 83	5213073	POWER TRANSFORMER (FS)	124	0626577	SPECIAL WASHER
△ 84	5213074	POWER TRANSFORMER (BS,AU)	125	0678312	DT SCREW-2.6MMX12MM (BLACK)
85	6174253	BATTERY LID	126	8699308	BT BIND SCREW-2.6MMX8MM (BLACK)
86	6488342	BATTERY BOX	127	7781581	BT FLAT SCREW-3MMX10MM
87	7756282	TERMINAL COVER (U,C)	128	7781582	FLAT SCREW-3MMX10MM (BLACK)
88	7758241	SWITCH COVER (FS,BS,AU)	129	8699414	BT BIND HEAD SCREW-3MMX14MM
89	7341143	PULLEY BRACKET	130	8602408	DT FLAT SCREW-3MMX8MM
90	6422541	COUNTER PULLEY ASSEMBLY	131	6714215	NYLON RIVET
91	7778356	POLYESTER WASHER	132	6768381	LED SPACER (FOR SOURCE/MONITOR INDICATOR)
92	7786115	POLYESTER WASHER	133	6768731	COUNTER HOLDER
93	6354471	COUNTER BELT	134	6768721	LED SPACER
94	7341183	CASSETTE METAL ASSEMBLY	135	6768671	LED SPACER
95	6761962	LAMP HOLDER	MISCELLANEOUS		
96	6768021	PUSH BUTTON ASSEMBLY (POWER) (U,C,FS,BS,AU)	136	6044693	BOTTOM COVER
97	6056243	POWER BUTTON ASSEMBLY (W)	137	6045501	UPPER COVER (U,C)
98	6055471	PUSH BUTTON ASSEMBLY (INPUT) (U,C,FS,BS,AU)	138	6044707	UPPER COVER (FS,BS,AU)
99	6055472	PUSH BUTTON ASSEMBLY (INPUT) (W)	139	6044706	UPPER COVER (W)
100	6055521	PUSH BUTTON (MONITOR) (U,C,FS,BS,AU)	140	6288673	KNOB (OUTPUT) (U,C,FS,BS,AU)
101	6055522	PUSH BUTTON (MONITOR) (W)	141	6288672	KNOB (OUTPUT) (W)
102	6055492	PUSH BUTTON ASSEMBLY (TAPE SELECTOR)	142	6289371	KNOB ASSEMBLY (RECORD R) (U,C,FS,BS,AU)
103	6768702	LAMP HOLDER	143	6289372	KNOB (RECORD R) (W)
104	6225042	FRONT PANEL ASSEMBLY (U,C,FS,BS,AU)	144	6288681	KNOB ASSEMBLY (RECORD L) (U,C,FS,BS,AU)
105	6225043	FRONT PANEL ASSEMBLY (W)	145	6288682	KNOB (RECORD L) (W)
106	6055482	RESET BUTTON	146	6291943	SLIDE KNOB (W)
107	6060391	PUSH BUTTON (ATRS)	147	6291942	SLIDE KNOB (U,C,FS,BS,AU)
108	6060392	PUSH BUTTON (FIXED)	148	6768754	FUNCTION BUTTON ASSEMBLY (W)
109	6060393	PUSH BUTTON (START) (U,C,FS,BS,AU)	149	6768751	FUNCTION BUTTON ASSEMBLY (U,C,FS,BS,AU)
110	6060395	PUSH BUTTON (START) (W)	150	6093531	CASSETTE DOOR ASSEMBLY
111	6768661	BUTTON HOLDER	151	6714214	NYLON RIVET
112	6055511	PUSH BUTTON (DOLBY NR,DOLBY B/C,NPX) (U,C,FS,BS,AU)	152	8698410	BT BIND SCREW-3MMX10MM (FS,BS,AU)
113	6055512	PUSH BUTTON (DOLBY NR,DOLBY B/C,NPX) (W)	153	8699410	BT BIND HEAD SCREW-3MMX10MM (BLACK) (U,C,W)

EXPLODED VIEW (Cabinet)

